Comments on Volume 3, Chapters 12,15,16,18,19

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To: DWR CWP Comments
Attachments: Comments on Vol3_Ch12_MunR~1.pdf (344 KB) ; Comments on Vol3_Ch15_Drin~1.pdf (366 KB) ; Comments on Vol3_Ch16_GWAq~1.pdf (371 KB) ; Comments on Vol3_Ch18_Poll~1.pdf (368 KB) ; Comments on Vol3_Ch19_Salt~1.pdf (373 KB)

Here are the Santa Clara Valley Water District's comments on California Water Plan Update 2013 Volume 3, Chapters 12,15,16,18, and 19.

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In the case of groundwater recharge with recycled water, the availability of groundwater downgradient may be increased, but there may be water quality impacts. Whether for storage or planned indirect use, the discharge of recycled water to wells, infiltration sites, or other locations underlain by permeable soil and geologic materials has the potential to introduce contaminants, including salts, into potable groundwater sources and aquifers. Modern microfiltration, reverse osmosis, and disinfection practices produce exceedingly high-quality recycled water, but lingering concerns about pathogens, emerging contaminants, or other potentially unknown contaminants warrant continued research to advance the science and technology in this area. Presently, California does not approve direct potable reuse projects, that is, where recycled water is piped directly from a treatment plant into a drinking water supply.

Recommendations

1. **Review Recycled Water Task Force recommendations.** The Recycled Water Task Force presented 26 recommendations to increase water recycling in its 2003 report, *Water Recycling 2030: Recommendations of California's Recycled Water Task Force*. Significant accomplishments have resulted from implementing the task force's recommendations. With the 10-year anniversary of the completion of the task force's efforts, DWR intends to review the recommendations and prioritize progress that should occur to complete the task force's mission.
2. **Develop approaches to facilitate increasing statewide use of recycled water for agricultural and environmental uses.** DWR, in cooperation with the SWRCB and the RWQCBs, will identify obstacles to increasing agricultural and environmental reuse of recycled water, with an emphasis on applications using secondary-treated wastewater. The focus of this effort is to implement "fit for purpose" and matching wastewater treatment levels to water quality requirements for the planned reuse to support meeting the State's 2020 and 2030 targets for recycled water use.
3. **Develop a uniform interpretation of State standards for recycled water.** State agencies including the SWRCB, the RWQCBs, the CDPH, DWR, and the CPUC should develop a uniform interpretation of State standards for inclusion in regulatory programs and IRWMPs and should clarify regulations pertaining to water recycling, including permitting procedures, health regulations and the impact on water quality. It is important to recognize that uniformity in State standards does not mean uniformity in permit terms and conditions, however, as implementation should account for the variability in local conditions and local needs. Implementing this recommendation could also streamline existing regulations about recycled water. Internal and cross-training of agency staff could be a key method of accomplishing this.
4. **Review National Research Council recommendations.** The National Research Council (2012) completed a comprehensive review of how recycled water use can be expanded. This report includes numerous recommendations, as well as possible approaches to implementing them. In 2013, DWR will take the lead in working with the other State agencies involved with recycled water to determine the applicability of the recommendations to California and to develop an approach to implementing these recommendations in California, as appropriate.
5. **Continue to review opportunities for recycled water development.** DWR will continue to identify opportunities to increase statewide planning, development, and implementation of recycled water. It is intended that this will be accomplished with comprehensive statewide planning documents and regional interactions over the next few years.
6. **Incorporate wastewater agencies into regional IRWM processes.** Inclusion of wastewater agencies into regional IRWM processes will facilitate the integration of recycled water into the

Summary of Comments on Vol3_Ch12_MunRecycledWater_PubicReviewDraft_Final_PDFed_co.pdf

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Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 2:04:44 PM

This should be reworded, maybe to "Continue to incorporate wastewater agencies into regional IRWM processes." In many regions, the wastewater agencies are active in the IRWM process. In the Bay Area, the wastewater agencies are leaders in the IRWM process.

water supply planning process. In addition, potential recycled water customers should be involved in the IRWM and recycled water project planning process to identify potential partnerships, assess the viability of recycled water projects, and consider future CII water quantity and quality planning.

7. **Provide dedicated recycled water funding.** The State Legislature is urged to provide additional funding dedicated to planning and implementing recycled water projects in California. Although some funds are available through IRWM grants and loans, the cost of implementing these projects can make them difficult to put forth in the existing grant processes, especially with so many water suppliers facing financial challenges. If California intends to reach its water recycling mandates and goals and support future water supply reliability to support economic growth, then additional funds dedicated to recycled water implementation will need to be provided. Additional funding sources will be needed when Proposition 84 funds are no longer available.
8. **Develop reliable electronic reporting methods for recycled water data**. To be able to monitor progress in meeting targets or achieving progress in beneficially using recycled water, there is a need for reliable and periodic data collection. Voluntary surveys have been the historic method of data collection. Mandating standardized data collection integrated with electronic reporting could facilitate the collection of data and the availability of the data for use. DWR, the SWRCB, and the CDPH should work together to accomplish this objective.

Municipal Recycled Water in the Water Plan

[This is a new heading for Update 2013. If necessary, this section will discuss the ways the resource management strategy is treated in this chapter, in the regional reports and in the sustainability indicators. If the three mentions are not consistent, the reason for the conflict will be discussed (i.e., the regional reports are emphasizing a different aspect of the strategy). If the three mentions are consistent with each other (or if the strategy is not discussed in the rest of Update 2013), there is no need for this section to appear.]

References

References Cited

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California Department of Public Health. 2011. Draft regulations for the replenishment of groundwater with recycled water. Viewed online at: http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Recharge/DraftRechargeReg-2011-11-21.pdf. Accessed: March 13, 2013.

California Department of Water Resources. 2008. *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*. Sacramento (CA): California Department of Water Resources. 30 pp. [White paper.] Viewed online at:

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Number: 1 Author: trachemm Subject: Highlight Date: 11/26/2013 2:05:39 PM

Number: 2 Author: trachemm Subject: Sticky Note Date: 11/27/2013 4:44:16 PM

Dedicated funding for local and recycled water projects, separate from IRWM funding, seems contradictory to State policy to practice integrated water management (IWM). Funding priorities should reflect State policy.

It might be more appropriate for the State to prioritize recycled water projects within the IRWM grant program, similar to how there were specific mandates for disadvantaged community projects (10% of total funding) and water conservation projects (at least $20 million) in Prop 84.

The intertie also allows a water utility to shut down a part of its system to do necessary maintenance without interrupting service to customers.

For example, a number of Bay Area water systems have constructed emergency interties with neighboring water systems. There is an emergency intertie between the East Bay Municipal Utility District (EBMUD), the City of Hayward, and the San Francisco Public Utilities Commission (SFPUC) to supply treated water among the three water systems and is intended to be used during planned outages, for needed maintenance, and to avoid service interruptions. EBMUD has two small interties, each able to carry 4 million gallons per day, with the City of Hayward which adjoins its service area. SFPUC, the agency in charge of the Hetch Hetchy water used by many Bay Area water districts and residents, has also constructed an intertie with the Santa Clara Valley Water ~~Agency~~ District and has been considering constructing another intertie. These interties may also play a role in the security of the water distribution system by creating a backup source should a terrorist act or disaster disrupt the source of supply from any single water provider.

In other cases, interties can provide untreated water between utilities in an emergency. For example, Contra Costa Water District (CCWD), whose service area is crossed by EBMUD Mokelumne pipeline, has an intertie which can be used to transfer untreated water between EBMUD and CCWD in an emergency.

Interties are one of the strategies for improving water supply reliability and quality which were recommended by the CALFED August 28, 2000 Record of Decision.

Potential Benefits

Improved water quality can directly improve the health of Californians, thereby improving the state's standard of living and reducing the burden and costs on the state's healthcare system.

Since 1989, a number of rules have been adopted by U.S. EPA and CDPH that are aimed at controlling both microbial pathogens and disinfection byproducts. The first of these rules were the Surface Water Treatment Rule (1989) and the Total Coliform Rule (1989). Both rules intended to reduce the risk to consumer of both viral and microbial pathogens in drinking water. As the regulatory community became more aware of the risks posed by organisms such as *Giardia*, *Cryptosporidium*, and certain enteric viruses present in surface water supplies, rules were adopted to address these risks and increase the degree of protection for consumers. These rules included:

- Interim Enhanced Surface Water Treatment Rule (1998).
- Filter Backwash Rule (2001).
- Long Term 1 Enhanced Surface Water Treatment Rule (2002).
- Long Term 2 Enhanced Surface Water Treatment Rule (2005).

Concurrently, rules were adopted to improve the disinfection process while at the same time providing protection against two groups of disinfection byproducts, trihalomethanes (TTHM) and haloacetic acids (HAA5). The following disinfection byproduct rules were adopted:

- Stage 1 Disinfection Byproducts Rule (1998).
- Stage 2 Disinfection Byproducts Rule (2006).

Summary of Comments on Vol3_Ch15_DrinkingWaterTreatmentDistribution_PublicReviewDraft_Final_PDFed_co.pdf

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Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 2:31:19 PM
The correct agency name is Santa Clara Valley Water District

Number: 2 Author: trachemm Subject: Highlight Date: 11/26/2013 2:30:53 PM

Number: 3 Author: trachemm Subject: Inserted Text Date: 11/26/2013 2:30:40 PM
District

pollution prevention and matching water quality to water use resource management strategies will help address water quality concerns while additional information is gathered. For pharmaceuticals and personal care products control of discharge to the environment is the best initial approach, via source control programs and reduction through wastewater treatment, rather than relying on drinking water treatment.

Emerging contaminants may be created by treatment itself, for instance, when water utilities implement new methods or processes for disinfecting water that may create new disinfection byproducts. For some contaminants, treatment options may be available, but they may be relatively expensive.

Recommendations

Because of the importance of drinking water, there is strong interest from many groups to promote improvements to drinking water treatment and distribution facilities, operation, and management. These groups include:

- Water system managers and operators.
- Local governmental agencies—city, county, planning.
- Regulatory agencies such as CDPH, local primacy agencies (county-level), and the U.S. EPA.
- Environmental and community stakeholders.

Based on the major issues outlined in this chapter, the following additional actions are needed to ensure there is adequate protection of public health through the maintenance of infrastructure, advancements in water treatment, and developing and maintaining relationships among the groups that advocate safe drinking water:

1. The Legislature should take necessary steps to maintain a sustainable source of funding of water supply, water treatment, and infrastructure projects to ensure a safe and reliable supply of drinking water for individuals and communities and to provide state matching funds for federal Safe Drinking Water State Revolving Fund monies.
2. Additional funding should be provided to CDPH to provide increased technical assistance to small water systems related to asset management and rate setting.
3. The Legislature should take steps to ~~require~~ publicly owned water systems to establish water rate structures at a level necessary to provide safe water, replace critical infrastructure, and repay financing for treatment and distribution system improvements necessary to meet drinking water standards.
4. State government should support enactment of a federal water infrastructure trust fund act that would provide a reliable source of federal assistance to construct and repair water treatment plants.
5. Additional programs should be developed to encourage regionalization and consolidation of public water systems. Regionalization and consolidation are useful both in achieving compliance with water quality standards and in providing an adequate economy of scale for operating and maintaining existing facilities as well as planning for future needs.
6. State government should continue to develop funding for small water systems and disadvantaged communities to assist in complying with drinking water standards.
7. State government should continue to encourage conservation and develop additional incentives, such as expanded rebate programs, to allow water systems to reduce the waste of limited water resources.

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This needs to be associated with a change in law that allows water systems to charge such rates without the limitations of Prop 218, etc.

Also, some smaller systems may not have a sufficient rate base to achieve this at a price affordable to their community.

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enable

8. Public water systems that provide flat rate water service should strongly consider changing to a metered water rate structure to discourage waste. In addition, water systems that have water meters for some customers but not on all service connections should strongly consider providing water meters for all customers.
9. State government should consider providing incentives that would encourage water systems to adopt rate structures that encourage conservation and discourage the waste of water.
10. The Legislature should establish a requirement for all public water systems, whether in urban or other areas of the state, to install a meter on each service connection and charge a metered rate for actual volume of water used.
11. California's regulatory agencies, such as the State Water Resources Control Board and California Department of Public Health, should maintain internship programs for college students to continue the interest of the next generation in water and environmental regulatory agencies.
12. State government should support research and development of new and innovative treatment technologies by providing funding for demonstration pilot projects. Additional program funding is also needed by CDPH to address the review and acceptance of these new treatment technologies adequately .
13. Water systems should fully evaluate residual disposal issues when planning new water treatment facilities due to increased costs and other issues associated with disposing treatment residual wastes.
14. All public water systems should be encouraged to join the California Water/Wastewater Agency Response Network. This program will provide mutual aid and assistance more quickly than the normal resource requests submitted through the Standardized Emergency Management System.
15. The control of pharmaceuticals and personal care products in the environment should be addressed initially via source control programs and reduction through wastewater treatment.

Drinking Water Treatment and Distribution in the Water Plan

[This is a new heading for Update 2013. If necessary, this section will discuss the ways the resource management strategy is treated in this chapter, in the regional reports and in the sustainability indicators. If the three mentions aren't consistent, the reason for the conflict will be discussed (i.e., the regional reports are emphasizing a different aspect of the strategy). If the three mentions are consistent with each other (or if the strategy isn't discussed in the rest of Update 2013), there is no need for this section to appear.]

References

References Cited

Cadmus Group, Inc. 2006. *Point-of-use or Point-of-entry Treatment Options for Small Drinking Water Systems*. Washington (DC): U.S. Environmental Protection Agency. 132 pp. April. EPA 815-R-06-010.Viewed online at: http://www.epa.gov/ogwdw/smallsystems/pdfs/guide_smallsystems_pou-poe_june6-2006.pdf.

California Department of Public Health. 2004. *Procedure for Cost-benefit Analysis of Arsenic*. Sacramento (CA): California Department of Public Health. [Web site.]

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Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 2:42:34 PM

Some public water suppliers may not be able to charge tier rates based on their enabling legislation. For instance, the Santa Clara Valley Water District Act requires us to charge a single rate per zone of benefit.

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Chapter 16. Groundwater/Aquifer Remediation

Portions of aquifers in many groundwater basins in California have degraded water quality that does not support beneficial use of groundwater. In some areas, groundwater quality is degraded by constituents that occur naturally (e.g., arsenic). In many urban and rural areas, groundwater quality degradation has resulted from a wide range of human (anthropogenic) activities. Groundwater remediation is necessary to improve the quality of degraded groundwater for beneficial use. Drinking water supply is the beneficial use that typically requires remediation when groundwater quality is degraded.

Groundwater remediation removes constituents, hereafter called contaminants, that affect beneficial use of groundwater. Groundwater remediation systems can employ passive or active methods to remove contaminants. Passive groundwater remediation allows contaminants to degrade biologically or chemically or disperse in situ over time. Active groundwater remediation involves either treating contaminated groundwater while it is still in the aquifer (in situ) or extracting contaminated groundwater from the aquifer and treating it outside of the aquifer (ex situ). Active in situ methods generally involve injecting chemicals into the contaminant plume to obtain a chemical or biological removal of the contaminant. Ex situ methods for treating contaminated groundwater can involve physical, chemical, and/or biological processes.

Active groundwater remediation systems that extract, treat, and discharge the treated groundwater to a water body or inject it back into the aquifer are commonly termed “pump and treat” systems. Remediation systems that extract and treat contaminated groundwater for direct potable, irrigation, or industrial use are commonly termed “wellhead treatment” systems. Any wellhead treatment prior to direct potable use must receive a permit from the California Department of Public Health (CDPH).

Contaminated groundwater can come from a many sources, both naturally occurring and anthropogenic. Examples of naturally occurring contaminants include heavy metals and radioactive constituents and also high concentrations of various salts from specific geologic formations or conditions. Climate change resulting in altered precipitation, snowfall patterns, and rising sea levels, all of which exacerbate salt water intrusion and flooding of low lying infrastructure and urban facilities will add new challenges to protect groundwater from contamination. Groundwater can also be contaminated from anthropogenic sources with organic, inorganic, and radioactive constituents from many specific sources and other more diffuse and widespread sources. These anthropogenic sources include industrial sites, mining operations, leaking fuel tanks and pipelines, manufactured gas plants, landfills, impoundments, dairies, septic systems, and urban and agricultural activities. The contaminant having the most widespread and adverse impact on drinking water wells is arsenic followed by nitrates, naturally occurring radioactivity industrial/commercial solvents, and pesticides (see Table 16-1).

PLACEHOLDER Table 16-1 Ten Most Commonly Detected Contaminants at Active Community Drinking Water Wells

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Summary of Comments on Vol3_Ch16_GWAquiferRemediation_PublicReviewDraft_Final_PDFed_co.pdf

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Number: 1 Author: georcook Subject: Sticky Note Date: 11/20/2013 8:16:32 AM

"Wellhead treatment" and "remediation" systems have two different purposes. Generally the purpose of "wellhead treatment" is to allow contaminated water to be used for the desired use, while the purpose of "remediation" systems is to clean-up groundwater. Although some "remediation" systems do put the treated water to a beneficial use, it is not typically referred to as "wellhead" treatment.

Number: 2 Author: georcook Subject: Sticky Note Date: 11/20/2013 8:18:53 AM

SCVWD recommends replacing "...from many specific sources and other diffuse and widespread sources" with "from both point and non-point sources"

In the process of extracting groundwater for remediation, the groundwater flows through the aquifer toward the extraction wells where it is removed for treatment. A number of ex situ treatment methods are available to remove contaminants from groundwater and the cost effectiveness of each treatment method should be evaluated prior to selection of a specific treatment method. Ex situ treatment methods can either transfer the contaminant to the atmosphere (directly or after combustion), to an adsorptive media, or to a concentrated liquid waste stream. If a volatile contaminant is transferred from the groundwater to the atmosphere, permits must be obtained from the local air district. If an adsorption media is used, such as granular activated carbon or ion exchange resin, the media may have to be disposed of as hazardous waste and this significantly increases the disposal cost. If the media is regenerated, then the waste residuals which are produced have to be disposed of as hazardous waste. If the contaminant is radioactive or the adsorption media removes radioactive compounds as a co-contaminant, such as uranium, then waste residuals may need to be disposed of as radioactive waste.

Whatever the treatment method listed below (See Table 16-2), it must be suited to the constituent that has contaminated the groundwater. Light, non-aqueous phase liquids (LNAPLs), such as hydrocarbons, float on the surface of the groundwater. Dense non-aqueous phase liquids (DNAPLs), such as perchloroethylene (PCE), have a specific gravity greater than water and sink to the bottom of the aquifer. Other contaminants, such as methyl-tertiary-butyl-ether (MTBE), may be miscible in water and are in solution in the groundwater. Even with LNAPLs and DNAPLs, some of the contaminant dissolves within the groundwater in the aquifer.

PLACEHOLDER Table 16-2 Treatment Methods

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

Groundwater Remediation in California

Most groundwater remediation in California involves ex situ groundwater extraction and treatment and does not rely on passive (in situ) remediation, such as biodegradation and natural attenuation. There are approximately 16,000 sites in the state where investigation or remediation of contaminants is ongoing. Regional Water Quality Control Boards (RWQCB), the California Department of Toxic Substances Control, or local agencies have regulatory oversight of these cleanups. About 7,500 of these sites have had a petroleum release from a leaking underground storage tank (UST) system. A petroleum release is usually detected by analyzing for total petroleum hydrocarbons and the more soluble constituents in fuel (benzene, toluene, ethyl benzene, and xylene, commonly called BTEX). In addition to these contaminants, polyaromatic hydrocarbons, naphthalene, and MTBE can be found at former leaking UST sites. Groundwater cleanup at petroleum sites primarily focuses on reduction of BTEX and MTBE because most other components of petroleum are only very slightly soluble in water and do not migrate far from the original source of the leak.

Remediation at petroleum UST sites may involve contaminant source removal (excavation and free-product removal if applicable). Further remediation can include soil vapor extraction, pump and treat, in situ remediation, or a combination of these methods. Pump and treat methodology tends to be expensive and is not employed if other effective remediation options are available. The discharge from a pump and treat system may also require a discharge permit issued by a Regional Water Quality Control Board.

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Number: 1 Author: georcook Subject: Sticky Note Date: 11/20/2013 8:20:57 AM

SCVWD recommends providing a source for the first sentence. In the past this may have been true, but recent trends have more sites moving away from pump and treat and moving to in-situ methods and natural attenuation.

Number: 2 Author: georcook Subject: Sticky Note Date: 11/19/2013 2:46:17 PM

The US Environmental Protection Agency oversees superfund sites

in fertilizer imported from Chile. Perchlorate is highly soluble in water and has adverse health effects at very low concentrations in water. Perchlorate is being removed by either ion exchange or biological treatment from the Bunker Hill, Gilroy-Hollister Valley, Rialto-Colton, Sacramento, and San Gabriel groundwater basins. In the Gilroy-Hollister Valley, the groundwater is being treated to reduce/remove perchlorate prior to delivery to private residences.

Pesticides, especially the agricultural soil fumigants 1,2-dibromo-3-chloropropane (DBCP) and ethylene dibromide, have been found in groundwater in the San Joaquin Valley, Tulare Lake region and Southern California (Riverside and San Bernardino Counties). Wellhead treatment systems have been installed by water purveyors in several communities.

Arsenic is the most widespread contaminant affecting an estimated 587 community drinking water wells (State Water Resources Control Board 2012). All ten hydrologic regions in the state, have community water systems that are affected by arsenic and must treat their affected wells to reduce the arsenic level below 10 micrograms per liter, the current maximum contaminant level (MCL).

Nitrate is considered the second most widespread groundwater contamination problem in California affecting community drinking water wells, primarily due to decades of agricultural application of -nitrogen-based fertilizers. Nitrate-contaminated groundwater can be either treated with reverse osmosis, resin-based processes, or blended with higher quality water before being placed in a water supply distribution system. Several small communities throughout the state have not been able to afford nitrate treatment systems and they must inform residents that sensitive populations, including small infants and pregnant and nursing women, should not consume this untreated drinking water. Accordingly, these small communities should explore other options such as developing a new water source or interconnecting/consolidating with a neighboring community water system. Nitrate is a salt and salt management is addressed as a separate resource management strategy in Volume 3, Chapter 19 Salt and Salinity Management.

One area that is effectively dealing with salt management is the Chino basin in the Santa Ana River watershed. The Chino Basin Optimum Basin Management Program is operating a desalter to remove nitrate that has accumulated in the groundwater from long-term agricultural operations. The treated water is used for potable supply once the nitrate drinking water standard is met. The brine from the desalters is discharged to a “brine line” that feeds into the Orange County Sanitation District’s wastewater treatment plant. Effluent from the treatment plant is discharged to the Pacific Ocean through an outfall.

Septic tank systems can be a localized source of high nitrate contamination in groundwater as well as dairies and other agricultural activities. An estimated 250,000 to 600,000 private domestic wells in California are commonly located near septic systems because building codes allow a minimum of 100 feet of separation between the two. Contaminant plumes from septic tank leach fields have been shown to travel hundreds of feet horizontally in groundwater with little dispersion or dilution of the plume. Domestic wells that are shallow and are not properly sealed are vulnerable to surface contaminants including leachate plumes from nearby septic tank systems.

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Number: 1 Author: georcook Subject: Sticky Note Date: 11/26/2013 4:44:23 PM

This sentence should be revised as it is not accurate. The extracted and treated groundwater from the Olin site in Morgan Hill is being re-injected to the shallow aquifer - it is not being delivered to private residences. There are a few wellhead treatment systems being used to address specific wells. SCVWD recommends revising this sentence to read, "In the Gilroy-Hollister Valley, the groundwater is being treated to reduce/ remove perchlorate prior to re-injection into the shallow aquifer."

Number: 2 Author: georcook Subject: Sticky Note Date: 11/27/2013 11:01:19 AM

Nitrate is a widespread and serious problem in many areas of the state that needs to be addressed. SCVWD has the following recommendations:

1. Chapter 19 should be revised to address Salt and nutrient management, which would be consistent with the approach taken by the SWRCB in the Recycled Water Policy. Currently it discusses salts in general, but lacks discussion and recommendations related to nitrate and other nutrients.

2. If Chapter 19 is revised to include nitrates and other nutrients, this paragraph should be very broad, introducing nitrate and other nutrients and the following 2 paragraphs should be deleted.

3. Where nitrate is discussed, other sources of nitrate should be included (i.e. septic systems, concentrated animal waste facilities, and atmospheric deposition).

Number: 3 Author: georcook Subject: Sticky Note Date: 11/27/2013 11:17:05 AM

SCVWD recommends that to be consistent with state policy, and that Volume 3, Chapter 19 should address salt and nutrient management.

Major Implementation Issues

Water Quality

Several groundwater quality issues complicate remediation efforts. The type and the concentration of the constituents vary from aquifer to aquifer. Contaminated water associated with historic commercial, agricultural, and industrial chemical discharges may contain a variety of regulated and unregulated contaminants. Non-point source contamination, such as nitrates or elevated levels of boron or salts in agricultural areas, can be widespread in the subsurface and can leach into the groundwater from surface infiltration or rising groundwater levels. Rising sea levels may also increase resource needs to combat seawater intrusion. Contaminated water may be poorly characterized in terms of the contaminants that are present and defining the dimension of the plume is costly. California has a number of Superfund sites where treatment system costs may transfer to the State, which will require additional funding. Emerging contaminants may not be known at current detection levels. The impact of emerging contaminants is also not known. The ability to remediate emerging contaminants is not fully known, although research is being conducted. Reverse osmosis and advanced oxidation processes may prove to be adequate water treatment technologies.

Aquifer Characteristics

California's groundwater basins usually include a series of alluvial aquifers with intermingled aquitards (California Department of Water Resources 2003). Lack of specific knowledge about the geometry and characteristics of an aquifer complicates groundwater remediation. Without this information, it is not possible to develop a cost-effective remediation strategy. How much groundwater is being pumped is unknown. The storage volume of each aquifer and how much of it is contaminated are likewise unknown. The State Water Resources Control Board's Groundwater Ambient Monitoring and Assessment Program (GAMA) was created in 2000. The program's main goals are 1) improving statewide groundwater monitoring and 2) increasing the amount of groundwater quality information available to the public. While this program has made significant progress, much more data is needed to overcome the current lack of knowledge of groundwater hydrogeology, geometry, and characteristics.

Costs of Investigation and Treatment

Costs can impede groundwater remediation. Who will pay, who are the responsible parties, and what is the appropriate share for each responsible party? Site investigation is expensive, particularly when solvents are the contaminant. Groundwater treatment is expensive, and it can take years, decades, or longer to remediate contaminated groundwater sites. Delays in implementing groundwater remediation while the contaminants spread can significantly increase the cost and time required for remediation. This is especially true if long-term litigation is involved to determine responsible parties.

Aside from the UST Cleanup Fund, funding for remediation is provided by responsible parties or parties willing to do the remediation (e.g., city and county agencies). In urban areas, it is often difficult to assign responsibility for the legacy of many decades of discharges of contaminants from disparate sources. Where responsibility can be assigned, responsible parties may not be able to fund investigation and remediation (e.g., dry cleaning business owners). Therefore, wellhead treatment costs are often borne by water purveyors and their customers.

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Number: 1 Author: georcook Subject: Sticky Note Date: 11/20/2013 8:36:44 AM
SCVWD recommends moving the discussion of salts and nitrate to Volume 3, Chapter 19.

Number: 2 Author: georcook Subject: Sticky Note Date: 11/20/2013 8:39:19 AM
Revers osmosis and advanced oxidation have already been proven for some contaminants. If this sentence is referring to these technologies use for treatment of emerging contaminants, it should be revised to be more clearly stated.

This paragraph should be re-written, multiple topics, poorly organized.

Number: 3 Author: georcook Subject: Sticky Note Date: 11/27/2013 11:27:44 AM
SCVWD recommends revising this paragraph as it is unclear.

1. The relevance of the amount of groundwater being pumped and basin storage to remediation is unclear.

2. GAMA is primarily concerned with groundwater quality, not aquifer characteristics. This program would be more appropriately included under the previous section, "Water Quality".

3. The level of detail necessary for aquifer remediation is site-specific. Often the level of detailed information needed for aquifer cleanup is too detailed for statewide purposes.

to operate and maintain a new treatment facility. Annual operation and maintenance costs are typically high for removing inorganic chemicals such as arsenic, nitrate, and perchlorate. In the past the operation and maintenance costs for these treatment facilities has been underestimated, resulting in cost overruns and causing insolvency in some communities. State and federal funding is available to water systems, however most funding programs only cover the capital costs of installing the treatment system, and do not cover the ongoing operation and maintenance costs. There have been instances in which a community installed a treatment plant to remove a groundwater contaminant only to shut down the treatment facility later when it could not afford to operate and maintain the treatment facility.

Use of Extremely Impaired Water Sources for Domestic Water Supply

CDPH considers sources that exceed 10 times a chronic MCL or notification level (NL) or three times an acute MCL or NL or have several different types of contaminants to be extremely impaired water sources and require more investigation and reliable treatment. The investigation involves identifying all known and possible contaminants that could be in the source, a risk assessment in the event of a treatment failure, and the resultant quality of the treated water. The treated water quality objective must take into account the allowable levels of the contaminants and the synergistic effect of similar compounds in the source water. This requires a public hearing to assess public acceptance.

Recommendations

The following recommendations can help prevent pollution, protect groundwater quality, and remediate groundwater where necessary to maintain California's water resources:

1. The Legislature should fund State regulatory agencies to identify historic commercial and industrial sites with contaminant discharges and identify viable responsible parties to investigate and remediate those sites.
2. State agencies should assist local governments and local agencies to implement source water protection measures based on the source water assessments that were completed as of 2003 to protect recharge areas from contamination and prevent future contamination.
3. State agencies should assist local agencies with authority over land use to prevent contamination of recharge areas.
4. Local government and local agencies with responsibility over land use should limit potentially contaminating activities in areas where recharge takes place and work together with entities that propose potentially contaminating activities to develop a sustainable good quality, long-term water supply for beneficial uses.
5. Work with the U.S. Environmental Protection Agency, the Bureau of Indian Affairs, and tribes to accomplish the objectives of recommendations 2, 3, and 4.
6. The State should establish and support research funding at California universities for wellhead treatment systems.
7. The State should establish and support research for detecting emerging contaminants by commercial laboratories.
8. Agencies involved in groundwater cleanup and oversight projects should collaborate and leverage resources and authorities to minimize overlap and improve outcomes.
9. Agencies involved in groundwater cleanup and groundwater purveyors should improve outreach and coordination for regional issues to develop new approaches to aquifer preservation and cleanup.

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Number: 1 Author: georcook Subject: Sticky Note Date: 11/20/2013 8:54:24 AM

The State, either through legislation or other mechanisms, should develop policies and/or programs to provide technical/financial assistance to Responsible Parties who are willing, but unable to afford the required investigation/clean-up. One example would be to develop a fund similar to the UST clean-up fund to address dry cleaners.

Number: 2 Author: georcook Subject: Sticky Note Date: 11/20/2013 8:56:26 AM

The State needs to work with the groundwater management agencies as well as other local government and agencies.

Number: 3 Author: georcook Subject: Sticky Note Date: 11/20/2013 9:22:26 AM

SCVWD recommends including the following recommendation:

The State should improve coordination between DWR, State Water Resources Control Board, Department of Toxic Substances Control, and DPH to ensure consistent application of statewide policies.

Number: 4 Author: trachemm Subject: Sticky Note Date: 11/27/2013 11:30:31 AM

In addition to being able to detect emerging contaminants, we need to understand their significance to human health and the environment. There should be more research into this so we know what it means if we detect something.

- Improve coordination and leveraging of resources with other funding organizations such as USDA (EQIP), SWRCB's Clean Water State Revolving Fund (CWSRF), Department of Conservation Watershed Program Grants, Department of Water Resources Integrated Regional Water Management, and others.
- Focusing overall efforts and resources on high priority watersheds and problems, as defined by priority TMDLs and other region-specific problems.
- Acknowledging the balancing act required by SWRCB programs to clean up waters polluted by non-point-sources and to preserve clean waters.

In the next five years, the SWRCB expects to have a fully integrated database of existing and tested management measures and management practices, many success stories based on proper implementation and maintenance of these measures and practices, well-established cleanup programs based on actions taken pursuant to the NPS Implementation and Enforcement Policy, and an accurate assessment of the remaining NPS pollution problems in the state. The NPS Program Strategy will be updated by the SWRCB NPS Program after receiving new U.S. EPA NPS Program Plan guidance. The goal of this new guidance is to ensure a more cohesive and consistent set of NPS Strategies and reporting requirements for all states. At this time, the SWRCB will be well-positioned to take another long-term look at the future of NPS pollution cleanup priorities.

The SWRCB has developed the NPS Encyclopedia (http://www.waterboards.ca.gov/water_issues/programs/nps/encyclopedia.shtm) to help practitioners choose management practices for implementation. It is a free, online reference guide designed to facilitate a basic understanding of NPS pollution control and to provide quick access to essential information from a variety of sources. This is done through hyperlinks to other resources available on the Internet. The purpose of the NPS Encyclopedia is to support the implementation and development of the NPS aspects of TMDLs and watershed action plans with a goal of protecting high quality waters and restoring impaired waters. The companion tool, the Management Practices MP Miner (http://mpminer.waterboards.ca.gov/mpminer/), allows users to cull data from studies of management practices, peer reviewed and otherwise, by filtering studies using relevant site-specific variables, such as land use category, pollutant of concern, and removal efficiency required. Both tools are available at the SWRCB Web site as indicated above.

Agriculture

Agricultural activities that cause NPS pollution can include poorly located or managed animal feeding operations, overgrazing, plowing too often or at the wrong time, and improper, excessive, or poorly timed application of pesticides, irrigation water, and fertilizer. Farm and ranching pollutants include sediment, nutrients, pathogens, pesticides, metals, and salts. To control NPS pollutants generated from this land use category, agricultural management measures should address:

- Erosion and sediment control.
- Facility wastewater and runoff from confined animal facilities.
- Nutrient management.
- Pesticide application.
- Grazing management.
- Irrigation water management.
- Education and outreach.

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Number: 1 Author: Johnmchu Subject: Sticky Note Date: 11/26/2013 1:06:14 PM
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Number: 2 Author: Johnmchu Subject: Highlight Date: 11/14/2013 9:14:46 AM

Pollution prevention can be considered in the context of adaptation, while pollution treatment is generally associated with mitigation.

Pollution prevention activities, such as stormwater runoff management and low-impact development, can reduce or maintain the peak runoff from urbanized areas such that they can meet the channel capacity of the natural system without the need to construct new protection structures. Additional information is available in Chapter 20, Urban Stormwater Runoff Management in this volume.

Small rural water systems, which generally lack technical and financial capacities, may be more reliant upon pollution prevention measures than other options available to larger systems, such as advanced treatment. When surface water is polluted, the only other available source is groundwater. Therefore, preventing pollution of surface water keeps options for water supply open, which is especially important in areas where the groundwater resources may already be in overdraft.

By protecting the quality of surface water and near-shore coastal waters, this management strategy provides multiple benefits or uses by providing opportunities for water recreation activities, as well as serving as a water source for desalination plants, and maintaining suitable habitat for wildlife. A number of NPS success stories have been highlighted by U.S. EPA, see Box 18-3 for additional information.

PLACEHOLDER Box 18-3 U.S. EPA Non-point-Source Success Stories

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter] 1

Potential Costs

According to the 2008 U.S. EPA Clean Watersheds Needs Survey, California needs more than $30 billion to meet water quality and water-related public health goals of the Clean Water Act (U.S. EPA 2009b). This survey emphasized point-source discharges from wastewater treatment systems, which estimated more than $20 billion is needed to prevent point-source discharges. Measures to address and prevent NPS pollution were likely underestimated. Currently, U.S. EPA is conducting the 2012 Clean Watersheds Needs Survey and the timeline to release the final report in late 2013. There have been a number of requests and recommendations to represent the funding need for NPS pollution more accurately in the 2012 survey.

An assessment of water quality conditions in California shows that NPS pollution has the greatest effect on water quality. It affects some of the largest economic segments of the state's economy, ranging from agriculture to the tourist industry. As previously discussed, non-point-sources are not readily controlled by conventional means. Instead, they are controlled with preventive plans and practices used by those directly involved in those activities and by those overseeing such activities. The following examples provide some insight into the complexity and costs associated with NPS pollution prevention in California.

Clean Beaches

Runoff from urban areas can contain heavy metals, pesticides, petroleum hydrocarbons, trash, plastics, and animal and human waste (Heal the Bay 2009). This urban runoff can have a detrimental impact on one of California's greatest natural and economic resources, its world-renowned beaches. This natural

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Number: 1 Author: shredhar Subject: Sticky Note Date: 11/19/2013 1:32:40 PM
Should include examples of pollution prevention activities in California that have proven to be successful. Link provided at chapter end is inadequate.

water quality from source to tap. For example, the SWRCB and RWQCBs regulate ambient water quality, while the Department of Public Health primarily regulates treatment and distribution of potable water. Further, surface water storage and conveyance in California is managed mostly by the Department of Water Resources and the U.S. Bureau of Reclamation, while groundwater is usually not managed in a coordinated manner at all. Moreover, providing drinking water to Californians is an obligation of cities, water districts, private water companies, and small water systems that generally were not formed in any comprehensive pattern.

Efforts to coordinate, collaborate, and leverage various agency authorities towards improvements of water quality in California have been initiated and will need to continue in order to alleviate these institutional barriers. Finally, the diffuse nature of NPS pollution and the need to control sources on private and public land adds to the difficulties of instituting pollution prevention measures.

Climate Change

Climate change may exacerbate concentrations of pollutants in rivers and lakes from multiple sources. Higher temperatures will cause more algal blooms, reducing dissolved oxygen levels and decreasing filter capacity. Storm events following forest fires may result in increased deposition of pollutants in waterways. Also, pesticide application may increase as more pests survive warmer and drier winter conditions. In the urban environment, the projected stronger storms may also overwhelm urban stormwater systems, leading to additional dispersion of pollutants into waterways.

Adaptation

New standards for land use and development, such as fewer impervious surfaces, more on-site use of rainwater, and more vegetated areas should assist to reduce the amount of pollution in populated areas. Forest management techniques, such as small biomass removal and integrated pest management practices, can also reduce the likelihood of catastrophic fires and increased pesticide use to combat pest infestations. Another adaptation measure may include higher levels of treatment for discharges into rivers and lakes. In the agricultural sector, reduced application of nitrogen-based fertilizers could advance adaptation by maintaining groundwater quality for beneficial uses.

Mitigation

Vehicles are one of the major mobile (non-point) sources of pollution. Shifts to reduce vehicle use and away from gasoline-fueled vehicles may reduce the volume of pollutants entering waterways. Fewer pollutants could result in reduced water treatment needs, which would mean less energy usage and fewer GHG emissions. Further adoption of low-impact development measures could also reduce pollution in urban settings. In agricultural settings, additional use of integrated pest management and reduced fertilizer application techniques could reduce the energy use associated with pesticide application and groundwater nitrates treatment. In recognition that biomass resources generated by agriculture can be used as an energy source and as a strategy to address climate change, the dairy industry developed digester facilities that produce electricity from dairy manure. The Central Valley RWQCB supported this effort with the adoption of general waste discharge requirements (Order R5-2010-0116 and R5-2011-0039) that streamline the permitting process for these facilities.

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Number: 1 Author: Johnmchu Subject: Highlight Date: 11/14/2013 9:15:27 AM

Number: 2 Author: Johnmchu Subject: Sticky Note Date: 11/26/2013 1:07:29 PM

We suggest inclusion of additional adaptation activities that reduce pollution including : Reduction of pollutants such as pesticides, plastic bags through a holistic program to regulate or promote the reduction of these pollutants in the environment through the use of substitute materials, proper disposal, and momentary incentives or disincentives.

modeled after the existing Interagency Ecological Program. The groundwater portion of this effort should be consistent with the recommendations of the Groundwater Quality Monitoring Act of 2001 and DWR Bulletin 118, while the surface water aspects should be coordinated with the SWRCB's Surface Water Ambient Monitoring Program.

4. Regional, tribal, and local governments and agencies should establish drinking water source and wellhead protection programs to shield drinking water sources and groundwater recharge areas from contamination. These source protection programs should be incorporated into local land use plans and policies.

Pollution Prevention in the California Water Plan

This is a new heading for Update 2013. If necessary, this section will discuss the ways the resource management strategy is treated in this chapter, in the regional reports and in the sustainability indicators. If the three mentions are not consistent, the reason for the conflict will be discussed (i.e., the regional reports are emphasizing a different aspect of the strategy). If the three mentions are consistent with each other (or if the strategy is not discussed in the rest of Update 2013), there is no need for this section to appear.]

References

References Cited

Central Valley Regional Water Quality Control Board. 2012a. *Central Valley Regional Water Quality Control Board. Order R5-2012-0116. Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed that are Members of the Third-Party Group*. Fresno (CA): Central Valley Regional Water Quality Control Board. 184 pp. Viewed online at: http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2012-0116.pdf.

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Ode PR, Kincaid TM, Fleming T, Rehn AC. 2011. *Ecological Condition Assessments of California's Perennial Wadeable Streams: Highlights from the Surface Water Ambient Monitoring Program's Perennial Streams Assessment (PSA) (2000-2007). A collaboration between the State Water Resources Control Board's Non-Point Source Pollution Control Program (NPS Program),*

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Number: 1 Author: Johnmchu Subject: Highlight Date: 11/14/2013 9:15:50 AM

Number: 2 Author: Johnmchu Subject: Sticky Note Date: 11/26/2013 1:08:07 PM

SCWVD agrees with the above recommendation as local entities often have knowledge of local conditions and also foster relationships with local stakeholders. A suggested addition to this recommendation is to state that the SWRCB and regional boards will collaborate and aid local entities in their plans, policies, guidelines and ordinances.

Chapter 19. Salt and Salinity Management — Table of Contents

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Number: 1 Author: trachemm Subject: Sticky Note Date: 11/27/2013 11:20:55 AM

Chapter 16 on GW/Aquifer Remediation says nitrate is addressed in this chapter. However, this chapter only minimally addresses nitrate management. Given nitrate's pervasive impact on groundwater and drinking water, nitrate management deserves greater prominence in the California Water Plan.

Recommendations

Salt and salinity management is a long-term commitment for California. Recommendations have been broken into two parts: short-term (5-10 years) to provide a solid framework on which to build and long-term/on-going to support regional/statewide management and implementation alternatives. Since the success will depend on a stable funding base, a separate recommendation for potential funding alternatives is included in Chapter 7, "Finance Planning Framework," in Volume 1. The following recommendations are complementary to other water quality resource management strategy recommendations because salt and salinity management is strongly tied to all elements.

Short-Term (5-10 Years)

1. **Address Priority Concerns.** Legislature should identify and prioritize planning and implementation funding to areas where salt and nitrate management have immediate and/or widespread benefits including:
   A. Areas with impacts to drinking water as identified in State Water Resources Control Board's Report to the Legislature on Communities that Rely on Contaminated Groundwater (Assembly Bill 2222, Statutes of 2008) and State Water Resources Control Board's Report to the Legislature on Addressing Nitrate in California's Drinking Water with a Focus on Tulare Lake basin and Salinas Valley Groundwater (Senate Bill X2 1).
   B. The Central Valley where improvements would benefit not just the valley, but also significant portions of California receiving water exported from the Delta.
2. **Support Regional Management.** Existing programs, such as the IRWM Grant Program and others, should prioritize funding to groups updating regional plans that include salt and nutrient management components or implementation projects, giving higher funding preference to areas with disadvantaged community participation, areas identified in Recommendation No. 1 above, and small water systems and individual wells with documented contamination.
3. **Centralize Validated Water Quality and Flow Data.**
   A. State agencies should provide support and funding for the California Water Quality Monitoring Council as it continues to evaluate and promote coordinated monitoring and data management throughout the state.
   B. As financially feasible, projects receiving state money for salt management should be required to follow appropriate quality assurance protocols and submit salt data to a publicly accessible database.
   Improved hydrological and water quality database management tools are critical to facilitate easier access and data sharing necessary for the success of basin-wide salinity management. Decision support requires timely and accurate data that will require a greater degree of collaborative sharing than exists at present. Discrete flow and water quality data is no longer sufficient for decision-making. Maintaining high quality continuous sensor data will require a significant investment in state-of-the-art information technologies such as screening and data quality control software that runs on web-based data servers. Adopting common data platforms, or at the very least, agreeing on hydrologic data management conceptual protocols such as ArcHydro and ArcHydro Groundwater, would go a long way to encourage data sharing and improve data access.
4. **The State should review its funding guidance and policies for consistency with sustainable salt management and make revisions where necessary.** Specifically:

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Number: 2 Author: trachemm Subject: Sticky Note Date: 11/27/2013 11:07:42 AM

The focus of this chapter is on salt management associated with things like TDS and chloride. Nitrate management is not the focus of this chapter. The chapter needs to be revised to have a stronger emphasis on nitrate issues or the recommendations related to nitrate management (especially with nitrate in groundwater serving small, disadvantaged, and/or rural communities) should be moved.

Number: 3 Author: trachemm Subject: Highlight Date: 11/27/2013 10:50:48 AM

Number: 4 Author: trachemm Subject: Sticky Note Date: 11/27/2013 11:03:35 AM

There is definitely a critical funding need for small water systems and wells in disadvantaged communities (and some rural communities) with contamination. However, the IRWM grant program may not be the best place to address these needs given its broad scope, competitive nature, extensive application and grant administration requirements, long processing time for reimbursement, limited funding for planning. A more targeted approach may be more effective.

Also, the needs for salt and nutrient management vary across the State. Some IRWM regions may have higher priorities at this time. For instance, SAWPA already had their brine line. That doesn't mean that their other projects are very important and worthy of funding also.

Number: 5 Author: trachemm Subject: Highlight Date: 11/26/2013 4:29:14 PM

A. Legislated grant and loan programs (including Proposition 84) should address salt management differently than other constituents and favor projects that coordinate with a regional salt management plan and are supported by the entities maintaining the regional salt plan.

B. When not explicitly prohibited by statute, public funding proposal solicitations should welcome projects with community-, watershed-, and regional-scale planning (specifically salt management planning) and water quality monitoring components.

C. Award caps should be consistent with implementation of community-, watershed- , and regional-scale salt management projects.

D. All salt management projects receiving public funding should be required to provide the awarding agency with an assurance that sufficient funding will be available to maintain the project during its life. These salt management projects should close in an environmentally acceptable manner based upon what can be foreseen at the time of project proposal.

Long-Term and Ongoing Needs

5. **Salt Storage and Other Research and Implementation.** Additional options for salt collection, salt treatment, salt disposal, and long-term storage of salt should be developed. University researchers should work with regulatory agencies and stakeholders to identify environmentally acceptable and economically feasible methods of closing the loop on salt for areas that do not currently have sustainable salt management options. Funding for this sort of research should be prioritized to ensure that areas with the greatest needs (i.e., high salt and few or no feasible management options) are targeted first (see recommendation No. 1). Specifically:
   A. Invest in research and development of environmentally acceptable means of storing salts for extended periods (decades) and sequestering salts (100+ years). Research should include identifying areas where such facilities can be sited with the least environmental impacts.
   B. Encourage additional research into more feasible means of using collected salt.
   C. Continue to evaluate an out-of-valley conveyance for the Central Valley such as a regulated brine line similar to the Santa Ana River Interceptor (SARI) system.
6. **Policies.** Entities with water policy-making authority should review existing policies, including those related to water use efficiency and funding of water projects, for consistency with sustainable salt management. Revisions should be made where necessary to ensure consistency with long-term sustainability objectives for multiple resources (e.g., water and energy). Effective salt management is not a stand-alone strategy and it should be integrated with other strategies. Every water use, water reuse, and waste disposal decision should include consideration of how the decision may affect the local and regional salt balance. Projects that propose to introduce saline water that may eventually mix with groundwater should be evaluated in the context of the basin's assimilative properties, California's Antidegradation Policy, and potential impacts on a broader holistic scale to allow for a systems management approach.
   When developing new policies and long-term strategies consideration must be given to policies adopted as the basis for ongoing activities. A good example is the policy to develop a Central Valley Drain to mitigate salt import and drainage impacts when extensive water supplies were provided through the Central Valley Project (CVP).
7. **Planning.** DWR and the USBR should actively participate in the Central Valley Salinity Alternatives for Long Term Sustainability (CV-SALTS) and other regional planning groups to de-

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There needs to be greater clarity as to why salt management should be treated differently than other constituents.